

key

Graphing Quadratics Practice Quiz

Name:

Graph the following quadratic functions.

1. $y = -2(x-3)^2 + 5$

vertex form

vertex $(3, 5)$

$y_{int} \quad y = -2(0-3)^2 + 5$
 $= -18 + 5$
 $= -13$
 $(0, -13)$

axis of symmetry

$x = 3$

$x = 1 \quad y = -2(1-3)^2 + 5$
 $= -2(4) + 5$
 $= -8 + 5$
 $= -3$
 $(1, -3)$

2. $y = \frac{1}{2}(x+1)(x-5)$ x-int form

x-int $(-1, 0) (5, 0)$

vertex $x = \frac{-1+5}{2} = 2$

$y = \frac{1}{2}(3)(-3) = -\frac{9}{2}$

axis of symmetry $x = 2$

$y_{int} \quad y = \frac{1}{2}(0+1)(0-5) = -\frac{5}{2}$

$(0, -\frac{5}{2})$

$x = -2 \quad (-2, \frac{7}{2})$
 $y = \frac{1}{2}(-1)(-7) = \frac{7}{2}$

3. $y = -x^2 - 3x + 3$

STANDARD FORM.

$y_{int} (0, 3)$

vertex $x = \frac{3}{2(-1)} = -\frac{3}{2}$

$(-\frac{3}{2}, \frac{21}{4})$

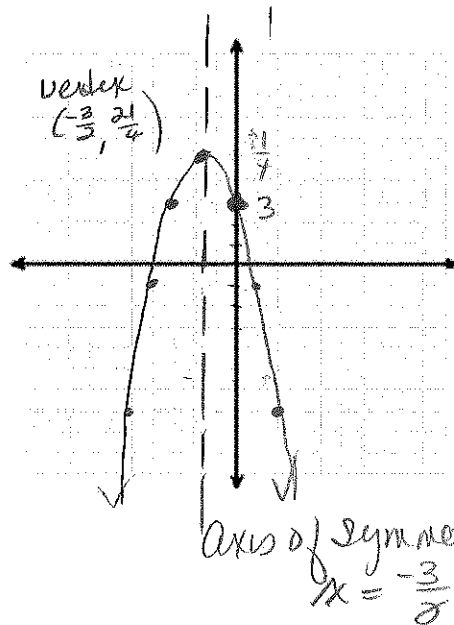
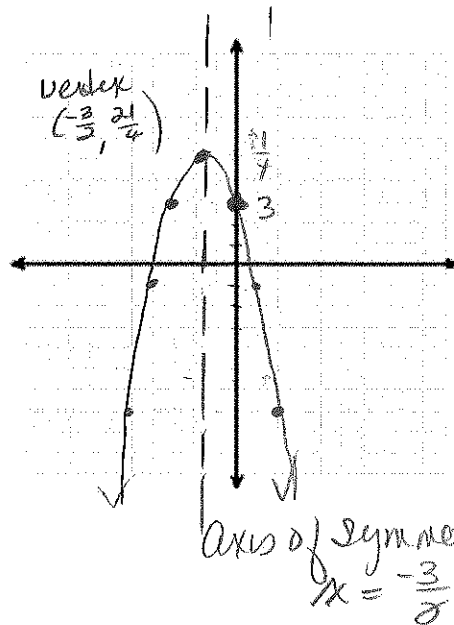
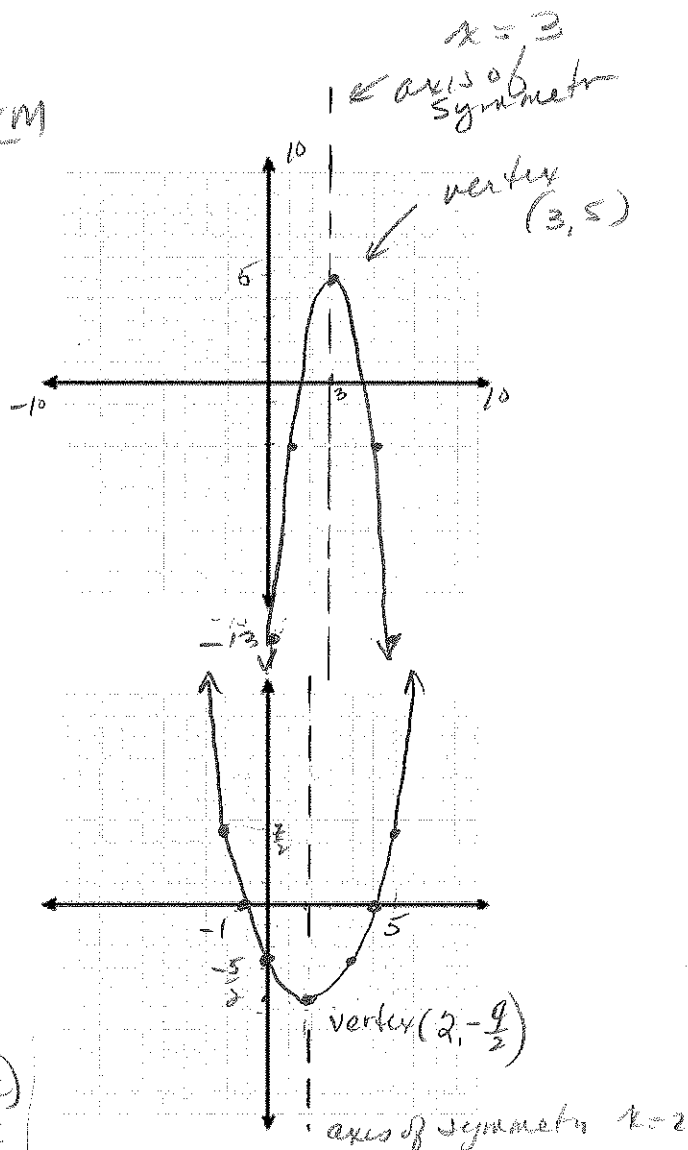
axis of symmetry

$x = -\frac{3}{2}$

$y = -(\frac{3}{2})^2 - 3(\frac{3}{2}) + 3$
 $= -\frac{9}{4} + \frac{18}{4} + \frac{12}{4}$
 $= \frac{21}{4}$

$x = 1 \quad y = -1 - 3(1) + 3$
 $= -4 + 3$
 $= -1$
 $(1, -1)$

$x = 2 \quad y = -4 + 6 + 3$
 $y = -7$
 $(2, -7)$



Problem Solving

4. Tickets to a school dance cost \$4 and the projected attendance is 300 people. For every \$0.10 increase in ticket price, the dance committee projects that attendance will decrease by 5.

- a) Determine the dance committee's greatest possible revenue.

Let $x = \# \text{ times}$
 Price decreases
 $R = \text{Revenue}$
 $R = (300 - 5x)(4 + .10x)$
 Zeros = x -int
 $300 - 5x = 0$
 $5x = 300$
 $x = 60$
 $4 + .10x = 0$
 $-.1x = -4$
 $x = 40$
 axis $x = \frac{-40 + 60}{2}$
 $x = 10$
 $R = (300 - 50)(4 + 1)$
 $= \$1250$

- b) What ticket price will produce the greatest revenue?

$x = 10$ price = \$5

The maximum revenue is \$1250.

The ticket price will be \$5.

5. A model rocket is launched from the roof of a building. Its flight path is modeled by $y = -5t^2 + 30t + 10$ where h is the height of the rocket above the ground in metres and t is the time after the launch in seconds. What is the rocket's maximum height?

$x = \frac{-30}{2(-5)} = 3$
 $y = -5(9) + 30(3) + 10$
 $= -45 + 90 + 10$
 $y = 55$

The maximum height is 55 ft.

6. A water balloon is catapulted into the air so that its height h , in metres, after t seconds is $h = -4.9t^2 + 27t + 2.4$

$t = 1$ $h = -4.9(1)^2 + 27(1) + 2.4$

- a) How high is the balloon after 1 second? $h = 34.3 \text{ m}$

- b) For how long is the balloon more than 30 m high?

$h = 30$

$30 = -4.9t^2 + 27t + 2.4$
 $0 = -4.9t^2 + 27t - 27.6$

- c) What is the maximum height of the balloon?

$x = \frac{-27}{2(-4.9)} = 2.755$ $h = -4.9(2.755)^2 + 27(2.755) + 2.4$

$t = 1.356$ $t = 4.154$
 $4.154 - 1.356$
 $= 2.798 \text{ sec}$

- d) When will the balloon burst as it hits the ground?

$h = 0$ when balloon hits ground

$0 = -4.9t^2 + 27t + 2.4$

$t = -0.088$ $t = 5.598 \text{ sec}$

